



The Model Based Enterprise and its Impact on Small Businesses

**Prepared By: Mitzi Whittenburg** 





#### Introduction



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Background: Over 25 years of supply chain experience in both commercial and defense industries. Last year she lead the BAE Systems Mentor Protégé team that won a Nunn-Perry award.

She is currently leading several supply chain projects for both the Army Research Development and Engineering Center's (ARDEC) Material, Manufacturing and Process Technology (MM&PT) Division and the Army ManTech program.





#### **Agenda**



- Overview of MBE
- How it will Effect You
  - A Change in the DoDCulture
  - The Technical Data Package
  - The eSourcing Solution
- Where to get More Information
- Conclusions
- Questions







Overview of the Model Based Enterprise (MBE) What is it?

**Overview of MBE** 

How it will Effect You

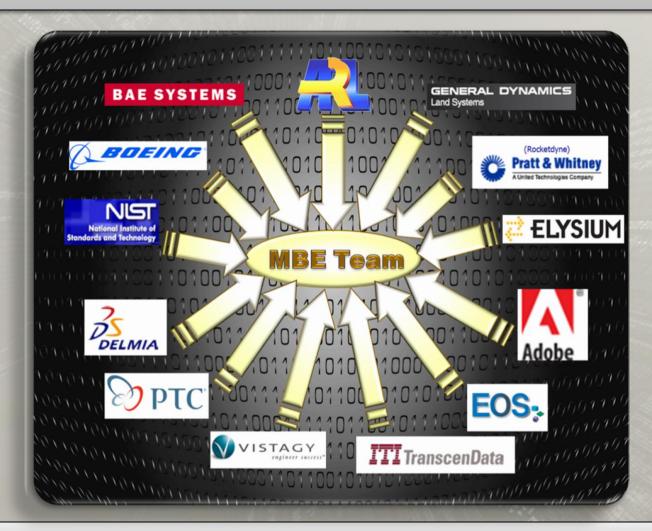
Where to get More Information

Conclusions

Questions

#### The MBE Team





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# The Journey



# **Drawing Based**

**Master 2D Drawing** 

# **Model Centric**

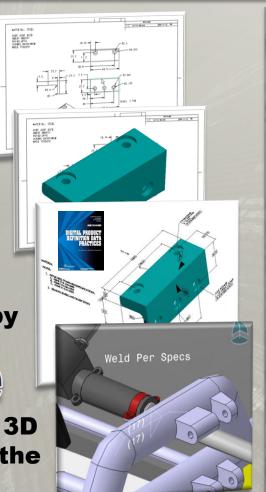
**3D CAD Model with Master 2D Drawing** 

# **Model Based Definition**

Master 3D CAD Model with 3D Drawing, 2D Drawings by exception

**Model Based Enterprise** 

Master 3D CAD Model with 3D Drawing fully leveraged by the Supply Chain





#### What is MBD & MBE?



#### **MBD**

A 3D annotated model and its associated data elements that fully define the product definition in a manner that can be used effectively by all downstream customers in place of a traditional drawing

#### **MBE**

A fully integrated and collaborative environment founded on 3D product definition detail and shared across the enterprise; to enable rapid, seamless, and affordable deployment of products from concept to disposal







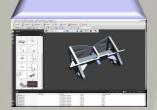
Concept

Design

**Production** 

Sustainment

End Of Life





# Why Are We Doing This?



The main purpose of the 3D TDP is to provide all Downstream users a 3D data set that they can reuse without remastering the data.

For suppliers this means they will have the ability to drive their CAM software straight from the model along with numerous other process.

All of this reduces the time to mission for the Warfighter.

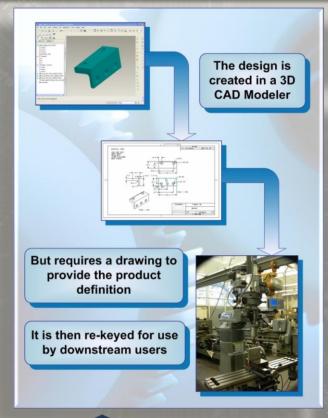


# Why Should You Care?



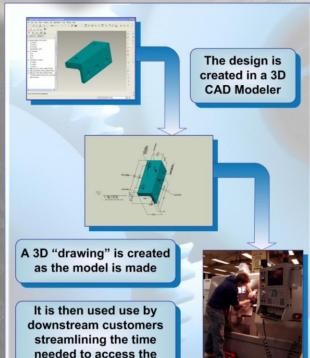
- It reduces errors

   and cost by
   limiting the
   number of times
   an object is remastered
- It dramatically cuts the time to mission
- It allows for increased collaboration and less ambiguity
- It is the direction the DoD is heading for TDPs



**Traditional Approach** 

#### **MBE Approach**



product definition

# **MBE Capability Index**



VO	

Model Centric Drawings for Design and Manufacturing

Primary Deliverable: 2D Drawing

Level 1

Model Based Manufacturing

Primary Deliverable: 2D Drawing and Neutral CAD Model

Level 2

Native CAD Based Manufacturing

Primary Deliverable: 2D drawing and Native CAD Model

Level 3

Model Based Definition

•Primary Deliverable: 3D Annotated Model and Light Weight viewable

Level 4

Model Based Definition With Data Management

•Primary Deliverable: 3D Annotated Model and Light Weight viewable via PLM

Level 5

•Model Based Definition With Automated Technical Data Package

Primary Deliverable: Digital Product Definition Package and TDP

Level 6

•MBD With Automated TDP and On Demand Enterprise Access

•Primary Deliverable: Digital Product Definition Package and TDP via the web





**Overview of MBE** 

**How it will Effect You** 

Where to get More Information

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#### **How MBE Will Effect You**

- A Change in the DoD Culture
- The Technical Data Package
- The eSourcing Solution

# **A Changing Culture**



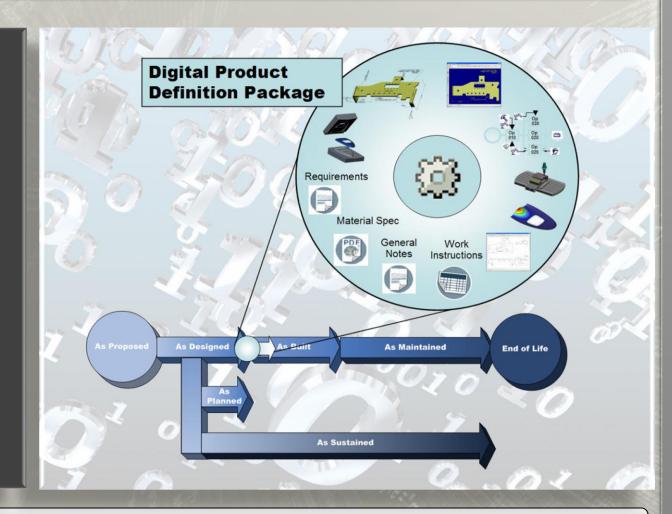
- Over the past 7 years the DoD has been making a concentrated effort to update not only its infrastructure but its process to be more on par with industry
- MBE has been a focus of many ManTech projects aimed at changing the culture from a Drawing based one to a true MBE environment
- Standards and Policies are about to be released in many areas to not only certify the model as the master but to procure a complete Technical Design Package whenever possible for reuse in sustainment
- To this end MIL-STD-31000 (the TDP standard) is being updated to be compatible with a 3D MBD



#### What is the TDP?



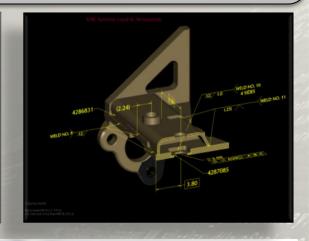
- 3D Geometry
- Associated Product Manufacturing Information (PMI), Annotations, and Notes
- Product Meta Data (i.e. Revision, Used On, Legal Noticed)
- Other Associated Documents
- Configuration Management
- Security

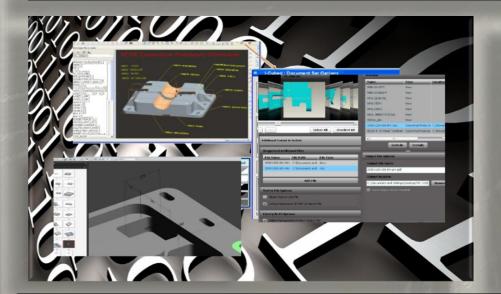


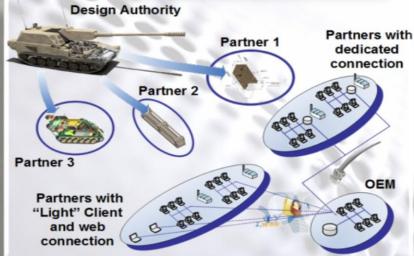
#### The 3D TDP



We have developed a process that allows for not only the standard creation of 3D TDP but also their delivery via a PDF package allowing for a true "CAD Agnostic" and free format







# Publishing "CAD Agnostic"



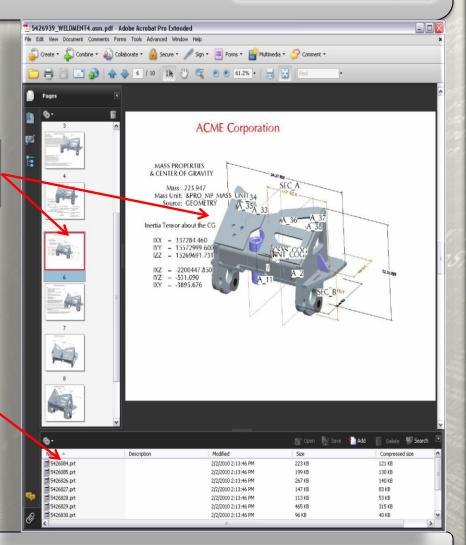
The publishing tool can automatically generate the 3D PDF

It provides both 2D reference views and a 3D

It currently works within Pro/Engineer



It also contains the native CAD files and STEP or any other needed information



# eSourcing Hub



eSourcing Hub

- Applies business rules to execute the "Make/Buy" function
- Matches manufacturing need with capability
- Distributes RFIs, RFPs, RFQs and TDPs

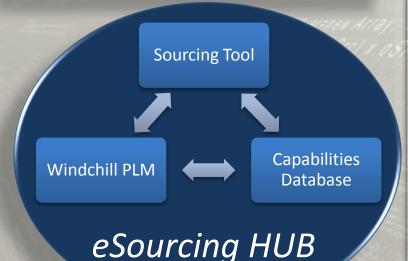
Capabilities Database

- Captures and characterizes all of the Organic Mfg Organizations
- Lists and identifies all of an Organization's MFG capabilities and capacity
- Also be used to characterize the Supply Base

**PLM Tool** 

- PLM = Product Lifecycle Management
- Used to configuration manage the Technical Product Definition
- Tools such as Windchill and SAP are already in place to do this

The eSourcing Hub will allow not only for the delivery of a 3D TDP but it will allow the DoD to be more responsive and to increase its supply base







**Overview of MBE** 

How it will Effect You

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Where to get More Information

The MBE Community

#### The Web



- The team has launched a MBE Website
- It is intended to act as an information source for the supply chain
  - It contains assessment results
  - Provides an information database for MBE
  - It's a place to communicate to with the supply chain



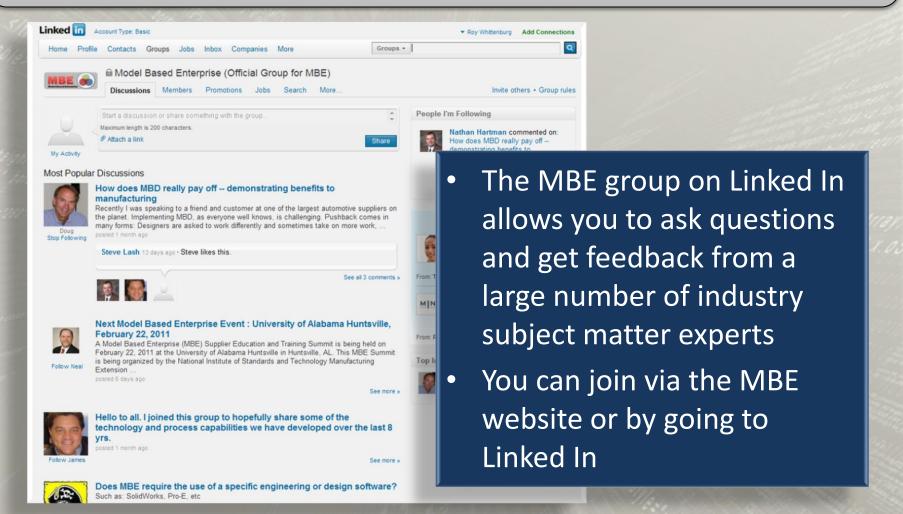
www.model-based-enterprise.org

For MBE to be effective for the entire supply chain, the Technical Data Package (TDP) must be in a format compatible with all CAD systems. OEMs have hundreds of suppliers that require access to data on an as needed basis. The OEM will not necessarily know what CAD system the supplier uses proc will they can.

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#### Linked In





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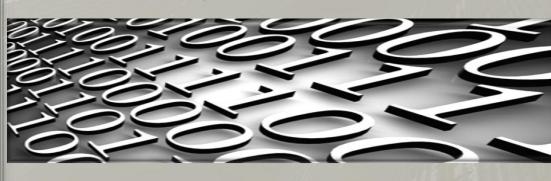
Questions

# Conclusions Pulling it all together

# In Closing



- The DoD is making the switch to a MBD based 3D TDP
- It will be CAD Agnostic
- It will facilitate re-use of the data
- It will contain the complete product definition
- It will help reduce the time to mission
- It will revolutionize the industry
- It is ready





# Questions





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